

CLAIMS

1. A method for stimulating the regeneration of a neuronal cell, said method comprising exposing the cell to the osteonectin protein or a functional equivalent thereof in an amount that is effective to stimulate the regeneration of the cell.
- 5 2. A method according to claim 1, wherein the neuronal cell is a CNS neuronal cell.
3. A method according to claim 1 or claim 2, wherein the cell is exposed to the osteonectin protein or functional equivalent thereof *in vitro*.
4. A method according to claim 1 or 2, where the cell is exposed to the osteonectin protein or functional equivalent thereof *in vivo* in a patient.
- 10 5. A method according to claim 4, wherein the neuronal cell is exposed to the osteonectin protein or functional equivalent thereof through the introduction into a patient of a nucleic acid molecule that expresses the osteonectin protein or functional equivalent thereof.
6. A method according to claim 5, wherein the neuronal cell is exposed to the osteonectin protein or a fragment or variant thereof through the introduction into a patient of a cell
15 that contains the nucleic acid molecule which expresses the osteonectin protein or a functional equivalent thereof in a therapeutically-effective amount.
7. A method according to claim 4, wherein said neuronal cell is exposed to a pharmaceutical composition comprising the osteonectin protein or functional equivalent thereof in an
20 amount appropriate to stimulate the regeneration of the cell.
8. A method according to claim 7, wherein said pharmaceutical composition comprises a cell which expresses the osteonectin protein or a functional equivalent thereof.
9. A method according to claim 6 or claim 8, wherein said cell is derived from the patient being treated.
- 25 10. A method according to any one of the preceding claims, wherein said neuronal cell is exposed to the osteonectin protein or functional equivalent thereof in the presence of one or more additional neurotrophic factors.
11. A method according to claim 10, wherein said one or more neurotrophic factors is selected from the group consisting of nerve growth factor, glial derived growth factor,

brain derived growth factor, ciliary neurotrophic factor, neurotrophin-3, vascular endothelial growth factor (VEGF), fibroblast growth factor (FGF) and platelet-derived growth factor (PDGF).

12. A method according to any one of the preceding claims, wherein said neuronal cell is
5 exposed to the osteonectin protein or functional equivalent thereof impregnated into an artificial bridging substrate which is placed at or near the site in the body at which neuronal regeneration is required.
13. A method according to claim 12, wherein said artificial bridging substrate is Elvax®.
14. A method according to any one of the preceding claims, wherein said stimulation of the
10 regeneration of a neuronal cell is in the context of the treatment of a disease selected from the group consisting of peripheral neuron damage, such as by physical injury or disease state such as diabetes, in the case of injury or a disease state of the CNS, including physical damage to the spinal cord, brain trauma, stroke, retinal and optic nerve lesions, neurodegenerative diseases such as Alzheimer's disease and Parkinson's disease,
15 neuromuscular diseases, autoimmune diseases of the nervous system, tumours of the central nervous system, damage to motor neurons such as occurs in amyotrophic lateral sclerosis, retinitis pigmentosa or age-related macular degeneration.
15. Use of the osteonectin protein or a functional equivalent thereof in the manufacture of a
20 medicament for the stimulation of neuronal cell regeneration, preferably, for the stimulation of CNS neuronal cell regeneration.
16. Use according to claim 15, wherein said osteonectin protein or a functional equivalent thereof is used in the manufacture of a medicament for the treatment of peripheral nerve damage, such as by physical injury or disease state such as diabetes, in the case of injury or a disease state of the CNS, including physical damage to the spinal cord, brain trauma,
25 stroke, retinal and optic nerve lesions, neurodegenerative diseases such as Alzheimer's disease and Parkinson's disease, neuromuscular diseases, autoimmune diseases of the nervous system, tumours of the central nervous system, damage to motor neurons such as occurs in amyotrophic lateral sclerosis, and retinitis pigmentosa and age-related macular degeneration.
- 30 17. A method of screening for a receptor protein that mediates the stimulation of neuronal cell regeneration, said method comprising exposing a cell to osteonectin, cross-linking

the osteonectin protein to a receptor on the cell, and analyzing the complex to identify the receptor.

18. A method of screening for a receptor protein that mediates the stimulation of neuronal cell regeneration, said method comprising contacting a candidate cell with the osteonectin protein or a functional equivalent thereof and assessing the ability of the cell to effect stimulation of neuronal cell regeneration.
19. A method according to claim 18, wherein a library of candidate cells is exposed to the osteonectin protein or a functional equivalent thereof.
20. A method according to claim 19, wherein said library of candidate cells has been transformed with a library of nucleic acid molecules, each nucleic acid molecule encoding a candidate receptor for osteonectin.